San Joaquin Valley Air Pollution Control District

Annual Air Monitoring Network Plan

June 25, 2013

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The District's Core Values and the District's Air Monitoring Network

* Protect Public Health *

The District uses data collected from the Valley air monitoring network to generate daily air quality forecasts and, when needed, issue health advisories. The District also uses data collected from the Valley's air monitoring network as the basis for long-term attainment strategies and to track progress towards health-based air quality standards.

* Active and effective air pollution control efforts with minimal disruption to the Valley's economic prosperity *

The District uses air monitoring data to help determine what kind of air pollution control efforts are needed to achieve health-based air quality standards.

* Outstanding Customer Service *
* Accountability to the public *

The District's website provides timely and easy public access to data from the Valley's real-time air monitors. The public can also access summaries of the previous seven days of air quality for ozone and particulate matter.

* Open and transparent public processes *

In addition to making air quality data available in real-time, the District uses air quality data in a variety of publicly available documents and reports. The District also conducts a public review period for annual monitoring network plans.

* Respect for the opinions and interest of all Valley residents *

The District has actively made daily air quality information available to Valley residents in a variety of formats, from the District website to the media, and even with air quality flags at schools. The District considers public interests in establishing new air monitoring stations.

* Ingenuity and innovation *

The District uses new and improved air monitoring techniques as these techniques are approved by the EPA. The District uses the latest science when siting air monitors. In turn, data collected from the monitoring network contributes to ongoing scientific evaluations.

* Continuous improvement *

The District evaluates the air monitoring network in the annual Monitoring Network plan for opportunities for better data collection and greater efficiency. Furthermore, improved air monitoring is a continuous effort; throughout the year, the District seeks out opportunities to improve the air monitoring network.

* Recognition of the uniqueness of the San Joaquin Valley *

The San Joaquin Valley is an expansive and diverse area. The District sites air monitors to represent each type of area and each portion of the region.

* Effective and efficient use of public funds *

An air monitoring network requires personnel, instruments, parts, energy, and leases. The District makes the most of limited resources by structuring the air monitoring network in a way that optimizes personnel time and funding for instruments. The result is a robust air monitoring network that helps the Valley reach its air quality goals without unnecessary expenditures.

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Executive Summary

The San Joaquin Valley Air Pollution Control District (SJVAPCD or District) operates an extensive network of air quality monitors throughout the San Joaquin Valley (Valley) to support its mission of improving and protecting public health. On a short term scale, District staff use the hourly readings from real–time monitors to communicate the state of the air quality to Valley residents. Through programs and venues such as the Real–time Air Advisory Network (RAAN), the Air Quality Flag program, the District website, and Valley media, Valley residents are able to obtain air quality information that can help them with their activity planning. The District also uses real–time air quality data to manage prescribed burning, agricultural burning, and residential wood combustion to ensure these activities do not make air quality unhealthy.

The Valley's attainment status for the U.S. Environmental Protection Agency's (EPA) health–based air quality standards is the foundation of the District's air quality attainment plans (such as the *2007 Ozone Plan*, the *2012 PM2.5 Plan*, and upcoming plans). As part of the District's long–term efforts to improve public health, air monitors collect data that is rigorously analyzed by laboratory technicians and District staff. This monitoring data determines the Valley's air quality and is fundamental in the Valley's effort to improve air quality and achieve attainment of EPA's health–based standards as quickly as possible.

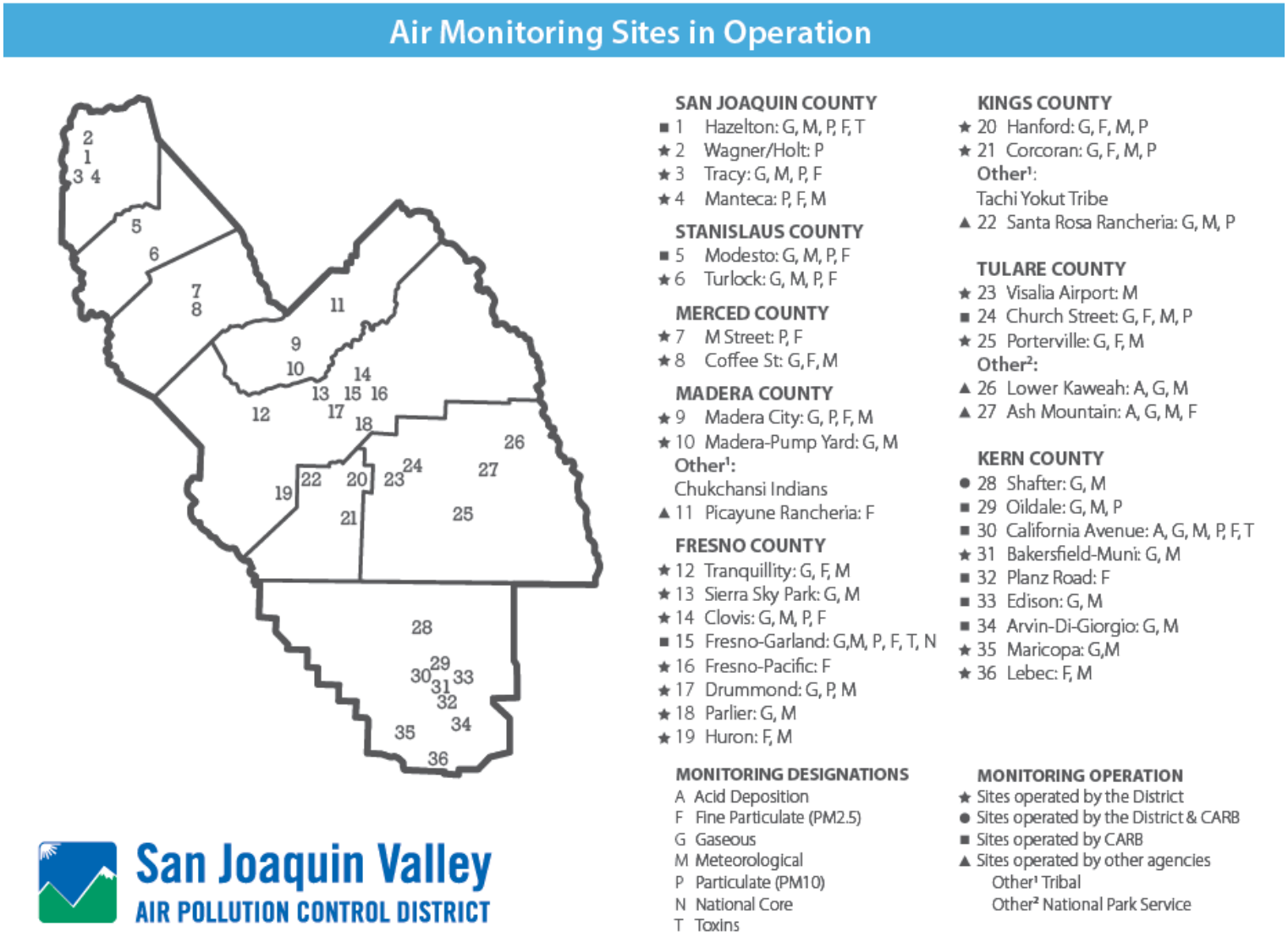
The San Joaquin Valley covers an area of 23,490 square miles, and the area is home to one of the most challenging air quality problems in the nation. The Valley is nonattainment for federal PM2.5 and ozone standards, and is in attainment of the federal standards for lead (Pb), Nitrogen dioxide (NO_2), Sulfur dioxide (SO_2), and Carbon monoxide (CO). In addition, the Valley is an attainment/maintenance area for PM10. The Valley is home to approximately 4 million residents, and includes several major metropolitan areas, vast expanses of agricultural land, industrial sources, highways, and schools. This expansive and diverse area comprises many air quality needs, yet there are limited financial and personnel resources for air quality monitoring.

Despite these limitations and challenges, the District maintains a robust air monitoring program. The District follows federal monitoring requirements and guidelines to ensure an efficient and effective monitoring network. Additionally, EPA encourages tribal monitoring. There are two tribal monitors operating in the Valley. The Tachi Yokut Tribe operates a monitoring station at Santa Rosa Rancheria located in Kings County, and the Chukchansi Indians of California operate a monitoring station at the Picayune Rancheria located in Madera County.

This monitoring network plan describes the District's approach for implementing federal air monitoring and quality control requirements and summarizes recent and upcoming changes to the monitoring network. As specified in 40 CFR 58.10(a), this plan is made available for public inspection at least 30 days prior to submission to EPA. This Network Plan summarizes the state of the District's air monitoring network during 2012, and through March 2013. Additionally, changes that the District may initiate through

June 2014 are described in the Summary of Planned Changes. A map of the air monitoring stations in the San Joaquin Valley is shown in Figure 1. Table 5 lists detailed information about all of the ambient air monitoring sites in the San Joaquin Valley Air Basin.

Figure 1 Map of Air Monitoring Sites in the San Joaquin Valley



Introduction: Air Monitoring Network Plan requirements

As specified in 40 CFR (Code of Federal Regulations) 58.10, and as part of requirement of the District's EPA 105 Grant, this air monitoring network plan describes the current state of the District's monitoring network and changes that are planned for the network. The annual monitoring network plan is updated and submitted to the EPA Regional Administrator each year, and is made available for public inspection for at least 30 days prior to submission to EPA. Air monitoring network plans provide the establishment and maintenance of air monitoring networks that may include the types of stations and equipment listed in Table 1.

Table 1 Types of Air Monitoring Stations and Equipment

Abbreviation	Full Name	Description
ARM	Approved Regional Method	A method that has been approved within a specific region for comparison to federal air quality standards. *Currently, there are no ARM monitors in the San Joaquin Valley.*
FEM	Federal Equivalent Method	These monitors are considered to be equivalent to FRM monitors for the purpose of determining compliance with EPA's health–based air quality standards.
FRM	Federal Reference Method	EPA defines how these monitors are to work, how they are to be engineered, and how they are to measure pollutants. These monitors are used to determine compliance with EPA's health–based air quality standards.
NCore	National Core	Multipollutant monitoring stations; in California, these are operated by the California Air Resources Board (CARB).
PAMS	Photochemical Assessment Monitoring Station	VOC (volatile organic compounds) speciation sites used in serious, severe, or extreme ozone nonattainment areas for precursor evaluation.
SLAMS	State and Local Air Monitoring Station	Monitoring sites that are used for determinations of compliance with federal air quality standards, though they may be used for other purposes as well.
SPM	Special Purpose Monitor	Not included when showing compliance with the minimum air monitoring requirements; an example might include a temporary monitoring station set up in an area to measure short term air quality impacts of a source. Data collected from an SPM can be used for Regulatory purposes if the monitor has been operational for two years and if the monitor is an ARM, FEM, or FRM.
STN	Speciated Trends Network	PM2.5 speciation stations that provide chemical speciation data of PM.

The monitoring network plan should include a statement of purpose for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR part 58. The plan must contain the following information for each existing and proposed site (40 CFR 58.10 (b)):

- The MSA, CBSA, CSA, or other area represented by the monitor. MSA, CBSA, and CSA are statistical–based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau (see Table 2):
    - MSA: Metropolitan statistical area
    - CBSA: Core–based statistical area
    - CSA: Combined statistical area
- Air quality system (AQS) Aerometric Information Retrieval System (AIRS) Code site identification number (see Table 3).
- Locations: street address and geographical coordinates (see Appendix B).
- Sampling and analysis methods for each measured parameter (see Appendix B).
- Operating schedules for each monitor (see Appendix B).
- Monitoring objective and spatial scale of representativeness for each monitor (as defined in Appendix D to 40 CFR 58) (see Appendix B).
- Any proposals to remove or move a monitoring station within 18 months of a plan submittal. Any proposed additions and discontinuations of SLAMS monitors are subject to approval according to 40 CFR 58.14 (see Summary of planned changes section below).
- Each air monitor is sited to satisfy at least one of three specific criteria:
    - Population (see Table 4)
    - A specific geographic scale (see Appendix B)
    - Generally consistent pollution concentrations

There are several network plan requirements that pertain specifically to PM2.5 monitoring:

- The monitoring network plan must identify which sites are suitable and which are not suitable for comparison against the annual PM2.5 national ambient air quality standards (NAAQS) as described in 40 CFR 58.30 (see PM2.5 Monitors in the Valley section below).
- The plan must also document how the District provides for public review of changes to the PM2.5 monitoring network when the change impacts the location of a violating PM2.5 monitor, or the creation/change to a community monitoring zone.
- The District should submit any public comments received on PM2.5 monitoring changes in the submittal of the network plan.
- On March 18, 2013, EPA finalized the rule to revoke the term “population–oriented.” The final rule states that PM2.5 monitors at neighborhood scale or larger, or smaller scales that represent many locations in the same CBSA, are the only monitors representative of “area–wide” air quality that can be compared to the PM2.5 NAAQS.

Table 2 San Joaquin Valley Areas of Representation

TITLE	CODE
Metropolitan Statistical Area (MSA)	**Core–Based Statistical Area (CBSA) Code**
Bakersfield [1]	12540
Fresno	23420
Hanford–Corcoran	25260
Madera	31460
Merced	32900
Modesto	33700
Stockton–Lodi	44700
Visalia–Porterville	47300

[1] Monitors from both the District and the Eastern Kern County Air Pollution Control District can be counted when determining compliance with minimum monitoring requirements for the Bakersfield CBSA. However, only monitors located within the District's boundaries are included in this network plan.

Table 3 Site Identification and AQS AIRS Codes

MSA/CBSA: Fresno		
County: Fresno		
Site Name	**AIRS Code**	**Operating Agency**
Clovis–Villa	060195001	SJVAPCD
Fresno–Drummond	060190007	SJVAPCD
Fresno–Garland	060190011	CARB
Fresno–Pacific	060195025	SJVAPCD
Fresno–Sky Park	060190242	SJVAPCD
Huron	060192008	SJVAPCD
Parlier	060194001	SJVAPCD
Tranquillity	060192009	SJVAPCD
MSA/CBSA: Bakersfield		
County: Kern (Valley Portion)		
Site Name	**AIRS Code**	**Operating Agency**
Arvin–Di Giorgio	060295002	CARB
Bakersfield–California	060290014	CARB
Bakersfield–Muni [1]	060292012	SJVAPCD
Bakersfield–Planz	060290016	CARB
Edison	060290007	CARB
Lebec	060292009	SJVAPCD
Maricopa	060290008	SJVAPCD
Oildale	060290232	CARB
Shafter	060296001	Shared [2]
MSA/CBSA: Hanford–Corcoran		
County: Kings		
Site Name	**AIRS Code**	**Operating Agency**
Corcoran–Patterson	060310004	SJVAPCD
Hanford–Irwin	060311004	SJVAPCD

[1] The Bakersfield–Golden State AMS was closed in December 2009 and relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) AMS to serve as a PAMS Type 2 site. See Appendix C for details.
[2] Site operated by CARB and SJVAPCD.

Table 3 Site Identification and AQS AIRS Codes (Continued)

MSA/CBSA: Madera		
County: Madera		
Site Name	**AIRS Code**	**Operating Agency**
Madera–City	060392010	SJVAPCD
Madera–Pump Yard	060390004	SJVAPCD
MSA/CBSA: Merced		
County: Merced		
Site Name	**AIRS Code**	**Operating Agency**
Merced–Coffee	060470003	SJVAPCD
Merced–M Street	060472510	SJVAPCD
MSA/CBSA: Stockton		
County: San Joaquin		
Site Name	**AIRS Code**	**Operating Agency**
Manteca	060772010	SJVAPCD
Stockton–Hazelton	060771002	CARB
Stockton–Wagner/Holt	060773010	SJVAPCD
Tracy–Airport	060773005	SJVAPCD
MSA/CBSA: Modesto		
County: Stanislaus		
Site Name	**AIRS Code**	**Operating Agency**
Modesto–14th Street	060990005	CARB
Turlock	060990006	SJVAPCD
MSA/CBSA: Visalia–Porterville		
County: Tulare		
Site Name	**AIRS Code**	**Operating Agency**
Porterville	061072010	SJVAPCD
Sequoia–Ash Mountain	061070009	National Park Service
Sequoia–Lower Kaweah	061070006	National Park Service
Visalia–Airport	061073000	SJVAPCD
Visalia–Church	061072002	CARB

Table 4 San Joaquin Valley 2012 Population

County	Total County Population	Major Urban Area Pop > 100,000	Urban Area Pop < 100,000 and > 50,000
Fresno	945,711	Fresno	Clovis
Kern (Entire County)	850,006	Bakersfield	Delano
Kern (Valley Portion)	731,005 [1]	Bakersfield	Delano
Kings	152,419	—	Hanford
Madera	152,074	—	Madera
Merced	258,736	—	Merced
San Joaquin	695,750	Stockton	Lodi, Manteca, Tracy
Stanislaus	519,940	Modesto	Turlock
Tulare	450,840	Visalia	Porterville, Tulare
San Joaquin Valley Total	**3,906,475**		

[1] Population estimate for Kern County (Valley Portion) was calculated using census track data for the population living within the District's boundaries. The San Joaquin Valley Total includes the Kern (Valley Portion) population, not the Kern (Entire County) population. Data from California Department of Finance E–1 Population Estimates for Cities, Counties and the State, January 1, 2012.

Monitoring Objectives and Spatial Scales

Appendix D to 40 CFR Part 58 identifies three basic **monitoring objectives** that define the purpose of each analyzer:

- Provide air pollution data to the general public in a timely manner (**timely**/**public**).
- Support compliance with ambient air quality standards and emissions strategy development (**standards**/**strategy**).
- Support for air pollution research studies (**research support**).

Appendix D then identifies several general monitoring **site types** to meet the objectives that define what the monitor is measuring:

- Sites located to determine the **highest concentrations** in the area covered by the network.
- **Population oriented** sites to measure typical concentrations in areas of high population density.
- **Source impact** sites to determine the impact of significant sources or source categories on air quality.
- **General/background sites** determine background concentration levels.
- **Regional transport sites** located to determine the extent of regional pollutant transport among populated areas and in support of secondary standards
- Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare–related impacts.

Appendix D also identifies several scales of spatial representativeness, described in terms of physical dimensions of the air parcel or zone where air quality is expected to

be reasonably consistent around the monitor. The monitor thus represents that area, not just the point of the monitor. The **spatial scales** are:

- **Microscale**: An area ranging from several meters up to about 100 meters.
- **Middle scale**: An area covering between about 100 meters to 0.5 kilometers.
- **Neighborhood scale**: Covering an area between 0.5 and 4.0 kilometers in range.
- **Urban scale**: Covering an area of city–like dimensions, from about 4 to 50 kilometers.
- **Regional scale**: Covering a rural area of reasonably homogeneous geography without large sources, extending from tens to hundreds of kilometers.
- **National and global scales**: Representing concentrations characterizing the nation and the globe as a whole.

New monitoring stations and new monitors that are intended to be compared to the NAAQS must meet EPA siting criteria. A particular site might be appropriate for one or more pollutants. Some sites may be appropriate for all air pollutant monitoring, while other sites are only appropriate for a particular pollutant. The District balances a wide range of pollutant siting criteria, spatial scales, monitoring objectives, and practical concerns as it plans and operates its monitoring network.

This Network Plan summarizes the state of the District's air monitoring network during 2012, and through March 2013. Additionally, changes that the District may initiate through June 2014 are described in the Summary of Planned Changes. Table 5 lists detailed information about all of the ambient air monitoring sites in the San Joaquin Valley Air Basin.

Table 5 Ambient Air Monitoring Sites in the San Joaquin Valley Air Basin

MSA, County	Site Name	Address	Parameters Monitored
Bakersfield, Kern	Arvin–Di Giorgio	19405 Buena Vista Blvd, Arvin, CA 93203	Ozone
	Bakersfield–Planz	401 E. Planz Rd., Bakersfield CA 93307	PM2.5 FRM
	Bakersfield–Muni [1]	2000 South Union Ave., Bakersfield, CA 93307	Ozone, CO, NO2, Total– and Speciated–VOC wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation for PAMS program
	Bakersfield–California	5558 California Ave., Bakersfield, CA 93309	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM/Non–FEM non–regulatory, NO2, Lead, Toxics, Hexavalent Chromium (Cr^{6+}), wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Edison	Johnson Farm–Shed Rd, Edison, CA 93320	Ozone, NO2, wind speed, wind direction, outdoor temperature
	Lebec	1277 Beartrap Road, Lebec, CA 93243	PM2.5 BAM non–regulatory, wind speed, wind direction, outdoor temperature, barometric pressure
	Maricopa	755 Stanislaus St., Maricopa, CA 93352	Ozone, wind speed, wind direction, outdoor temperature, barometric pressure
	Oildale	3311 Manor St, Oildale, CA 93308	Ozone, PM10 FRM, wind speed, wind direction, outdoor temperature
	Shafter	578 Walker St, Shafter, CA 93263	Ozone, NO2, Total– and Speciated–VOC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation for PAMS program

[1] The Bakersfield–Golden State AMS was closed in December 2009 due to planned road construction and was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) AMS in 2012. See Appendix C for details.

Table 5 Ambient Air Monitoring Sites in the San Joaquin Valley Air Basin (Continued)

MSA, County	Site Name	Address	Parameters Monitored
Fresno, Fresno	Clovis–Villa	908 N. Villa Ave., Clovis, CA 93612	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM/FEM, CO, NO2, Total– and Speciated–VOC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation for PAMS program
	Fresno–Drummond	4706 E. Drummond St., Fresno, CA 93725	Ozone, PM10 FRM, PM2.5 FEM, CO, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
	Fresno–Garland	3727 N. First St, Ste. 104, Fresno CA 93726	Ozone, NO2, CO, SO2, PM10 FEM, PM2.5 FRM, PM2.5 FEM/BAM, PM2.5 BAM/Non–FEM non–regulatory, Lead, wind direction, outdoor temperature, relative humidity, barometric pressure
	Fresno–Pacific	1716 Winery, Fresno, CA 93726	PM2.5 FRM
	Fresno–Sky Park	4508 Chennault Ave, Fresno, CA 93722	Ozone, CO, NO2, wind speed, wind direction, outdoor temperature
	Huron	16875 4th St., Huron, CA 93234	PM2.5 BAM/Non–FEM non–regulatory, barometric pressure
	Parlier	9240 S. Riverbend Ave., Parlier, CA 93648	Ozone, NO2, Total– and Speciated–VOC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation for PAMS program
	Tranquillity	32650 W. Adams, Tranquillity, CA 93668	Ozone, PM2.5 BAM/FEM, wind speed, wind direction, outdoor temperature, barometric pressure

Table 5 Ambient Air Monitoring Sites in the San Joaquin Valley Air Basin (Continued)

MSA, County	Site Name	Address	Parameters Monitored
Hanford–Corcoran, Kings	Corcoran–Patterson	1520 Patterson Ave, Corcoran, CA 93212	PM10 TEOM/FEM, PM2.5 FRM, wind speed, wind direction, outdoor temperature, barometric pressure
	Hanford–Irwin	807 S. Irwin St, Hanford, CA 93230	Ozone, PM10 FRM, PM10 TEOM/FEM, PM2.5 BAM/FEM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
Madera, Madera	Madera–City	28261 Avenue 14, Madera, CA 93638	Ozone, PM10 TEOM/FEM, PM2.5 BAM/FEM, wind speed, wind direction, outdoor temperature, barometric pressure, relative humidity, solar radiation
	Madera–Pump Yard	Avenue 8 and Road 29 1/2, Madera, CA 93637	Ozone, NO2, Total– and Speciated–VOC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation for PAMS program
Merced, Merced	Merced–Coffee	385 S. Coffee St., Merced, CA 95340	Ozone, PM2.5 BAM/FEM, NO2, wind speed, wind direction, outdoor temperature
	Merced–M Street	2334 M Street, Merced, CA 95340	PM10 FRM, PM2.5 FRM
Stockton, San Joaquin	Stockton–Hazelton	1593 E. Hazelton St., Stockton, CA 95205	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM/FEM, CO, NO2, toxics, wind speed, wind direction, outdoor temperature, relative humidity
	Stockton–Wagner/Holt	8778 Brattle Pl., Stockton, CA 95209	PM10 FRM
	Manteca	530 Fishback Rd., Manteca, CA 95337	PM2.5 BAM/FEM, PM10 TEOM/FEM, wind speed, wind direction, outdoor temperature, barometric pressure
	Tracy–Airport	5749 S. Tracy Blvd., Tracy, CA 95376	Ozone, PM10 TEOM/FEM, PM2.5 BAM non–regulatory, NO2, wind speed, wind direction, outdoor temperature, barometric pressure, radio acoustic sounding system (RASS)

Table 5 Ambient Air Monitoring Sites in the San Joaquin Valley Air Basin (Continued)

MSA, County	Site Name	Address	Parameters Monitored
Modesto, Stanislaus	Modesto–14th Street	814 14th Street, Modesto, CA 95354	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM/FEM, CO, wind speed, wind direction, outdoor temperature, barometric pressure
	Turlock	1034 S. Minaret St., Turlock, CA 95380	Ozone, PM10 FRM, PM2.5 BAM FEM, CO, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
Visalia–Porterville, Tulare	Porterville	1839 S. Newcomb St., Porterville, CA 93257	Ozone, PM2.5 BAM non–regulatory, wind speed, wind direction, outdoor temperature, barometric pressure
	Sequoia–Ash Mountain	Ash Mountain, Sequoia National Park CA	Ozone, PM2.5 BAM non–regulatory, wind speed, wind direction, outdoor temperature, relative humidity, solar radiation
	Sequoia–Lower Kaweah	Lower Kaweah Campground, Sequoia National Park, CA	Ozone, wind speed, wind direction, outdoor temperature, relative humidity, solar radiation
	Visalia–Airport	9501 West Airport Drive, Visalia, CA 93277	Wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation, radio acoustic sounding system (RASS)
	Visalia–Church	310 N. Church St., Visalia, CA 93291	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM non–regulatory, NO2, wind speed, wind direction, outdoor temperature, barometric pressure

Ozone

Ozone is formed when its precursors (oxides of nitrogen (NOx) and volatile organic compounds (VOC)) chemically react in the presence of sunlight. The Valley's topography, high temperatures, subsidence inversions, and light winds are conducive to elevated ozone levels. Winds (at ground level or at higher altitudes) transport pollutants from other basins into the Valley, within the Valley to areas downwind, and from the Valley into other regions.

As specified in Table D–2 of Appendix D to Part 58, ozone monitoring site requirements are based on MSA and design values (see Table 6). Table 7 shows that the Valley's ozone monitoring network meets the requirements. Sites are intended to represent population exposures and maximum concentrations so most ozone monitors are representative of neighborhood and regional scales. The Valley's SLAMS ozone monitors are continuous analyzers that detect ozone through ultraviolet absorption. As continuous devices, these monitors meet the "Timely/Public" objective, providing District staff with the data used in AQI forecasting and reporting. The Valley's ozone monitoring sites, and their scales and site types are shown in Tables 8a and 8b.

Table 6 SLAMS Minimum Ozone Monitoring Requirements
(Table D–2 of Appendix D to Part 58)

MSA population, based on latest available census figures	Number of monitors required if:	
	Most recent 3–year design value concentrations ≥85% of any ozone NAAQS	Most recent 3–year design value concentrations <85% of any ozone NAAQS
> 10 million	4	2
4 – 10 million	3	1
350,000 – < 4 million	2	1
50,000 – < 350,000	1	0

Table 7 8–Hour Ozone Requirements for the San Joaquin Valley

Metropolitan Statistical Area (MSA)	2012 Population	Highest 2012 Ozone Design Value in MSA (ppb)	≥85% of 2008 ozone NAAQS (75 ppb)	Number of monitors required (Table 5)	Number of active SLAMS ozone monitor sites
Bakersfield[2]	731,005	93	Yes	2	6
Fresno	945,711	98	Yes	2	5
Hanford–Corcoran	152,419	90	Yes	1	1
Madera	152,074	86	Yes	1	2
Merced	258,736	83	Yes	1	1
Modesto	519,940	88	Yes	2	2
Stockton	695,750	80	Yes	2	2
Visalia–Porterville	450,840	95	Yes	2	2

[1] Air monitors in the Eastern Kern County Air Pollution Control District would count towards the monitors required for the Bakersfield MSA. However, the "Number of active ozone monitors" listed here includes those in the Valley Portion of Kern County only.

Table 8a San Joaquin Valley Ozone SLAMS Monitors

MSA	County	Site	Scale	Site Type	Monitoring Objective
Bakersfield	Kern	Arvin–Di Giorgio	Neighborhood	High Concentration, Regional transport	1, 2, 3
		Bakersfield–California	Neighborhood	Population	
		Bakersfield–Muni [1]	Neighborhood	High Concentration	
		Edison	Neighborhood	High concentration, Regional transport	
		Maricopa	Neighborhood	Regional transport	
		Oildale	Neighborhood	Regional transport	
		Shafter	Neighborhood	General/background	

1 – Standards/Strategy 2 – Research Support 3 – Timely/Public

[1] Bakersfield–Golden was shut down due to planned road construction in December 2009. The ozone equipment at the new Bakersfield–Muni site began operating in June 2012.

Table 8a San Joaquin Valley Ozone SLAMS Monitors (Continued)

MSA	County	Site	Scale	Site Type	Monitoring Objective
Fresno	Fresno	Clovis–Villa	Neighborhood	High Concentration, Population	1, 2, 3
		Fresno–Drummond	Neighborhood	Population, Regional transport	
		Fresno – Garland	Neighborhood	Population	
		Fresno–Sky Park	Neighborhood	Population, Regional transport	
		Parlier	Neighborhood	High Concentration, Regional transport	
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Hanford–Corcoran	Kings	Hanford–Irwin	Neighborhood	Population	1, 2, 3
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Madera	Madera	Madera–Pump Yard	Neighborhood	General/background	1, 2, 3
		Madera–City	Neighborhood	Population	
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Merced	Merced	Merced–Coffee	Neighborhood	Population	1, 2, 3
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Stockton	San Joaquin	Stockton–Hazelton	Neighborhood	Population	1, 2, 3
		Tracy–Airport	Neighborhood	Regional transport	

1 – Standards/Strategy 2 – Research Support 3 – Timely/Public

Table 8a San Joaquin Valley Ozone SLAMS Monitors (Continued)

MSA	County	Site	Scale	Site Type	Monitoring Objective
Modesto	Stanislaus	Modesto–14th Street	Neighborhood	Population	1, 2, 3
		Turlock	Neighborhood	Population	
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Visalia–Porterville	Tulare	Visalia–Church	Neighborhood	Population	1, 2, 3
		Porterville	Neighborhood	Population	

1 – Standards/Strategy 2 – Research Support 3 – Timely/Public

Table 8b San Joaquin Valley Ozone SPM Monitors

MSA	County	Site	Scale	Site Type	Monitoring Objective
Fresno	Fresno	Tranquillity	Urban Scale	Population	3
Visalia–Porterville	Tulare	Sequoia–Ash Mountain	Regional	High Concentration, Regional transport	3
		Sequoia–Lower Kaweah	Regional	Regional transport	3

3 –Timely/Public

Photochemical Assessment Monitoring Stations

The monitoring objective of Photochemical Assessment Monitoring Stations (PAMS) is research support. Federal regulations (Clean Air Act Section 182 and 40 CFR 58) require serious, severe, and extreme ozone nonattainment areas to have PAMS sites to take speciated measurements of ozone precursors and allow for better understanding of the effect of precursors, control measures, and photochemistry on ozone formation. PAMS sites measure ozone, NOx, total– and speciated–VOC for the PAMS program, CO, and meteorology concurrently. Although the Valley does not exceed federal or state standards for NO_2, NOx reductions contribute to air quality improvement for both ozone and PM.

There are four classifications of PAMS sites:

- Type 1: Background sites upwind of urban areas, where ozone concentrations are presumed not to be influenced by nearby urban emissions.
- Type 2: Maximum ozone precursor emissions sites, typically located in an urban center, where emissions strengths are the greatest.

- Type 3: Maximum ozone concentration sites, intended to show the highest ozone concentrations.
- Type 4: Downwind ozone monitoring sites intended to capture concentrations of transported ozone and precursor pollutants, and determine possible areas from which most of the transport may originate (Type 4 sites are currently not required for the San Joaquin Valley).

As shown in Table 9, the District has a total of six PAMS sites configured as two networks, one centered around Fresno and one around Bakersfield. The PAMS program operates from June 1 through August 31 every year on a 1 in 3 day sampling schedule with an hourly NMOC analyzer. At least four, three–hour integrated samples are collected each sampling day, referred to as a "Trend Day." However, additional samples are collected on "Episode Days," days that are forecasted to have high ozone concentrations. The goal is to sample on three to five multi–day episodes in an ozone season.

Table 9 SJV PAMS Sites (SLAMS)

Fresno MSA	Type 1: Upwind/Background site	Madera–Pump Yard
	Type 2: Maximum precursor emissions	Clovis–Villa
	Type 3: Maximum ozone concentrations	Parlier[1]
Bakersfield MSA	Type 1: Upwind/Background site	Shafter
	Type 2: Maximum precursor emissions	Bakersfield–Muni[2]
	Type 3: Maximum ozone concentrations	Arvin[3]

[1] An NOy monitor will become operational in 2013.
[2] Bakersfield–Golden was shut down for relocation in December 2009. The speciated PAMS equipment at the new Bakersfield– Muni site began operating in June 2012, and all of the other PAMS equipment except for NMHC began operating in July 2012. The NMHC equipment began operating in October 2012.
[3] Arvin–Bear Mountain Blvd. site has closed. PAMS equipment for the Type 3 site at the new Arvin–Di Giorgio site will be installed when space becomes available.

Particulate Matter (PM)

Particulate matter (PM) can be emitted directly as primary PM, and it can form in the atmosphere through chemical reactions of precursors to form secondary PM. Primary PM can be emitted either naturally: windblown dust and wildfires; or from human (anthropogenic) activity: agricultural operations, industrial processes, combustion of wood and fossil fuels, construction and demolition activities, and entrainment of road dust. The resulting ambient PM mixture includes aerosols consisting of components of nitrates, sulfates, elemental carbons, organic carbon compounds, acid aerosols, trace metals, geological materials, etc. Under current regulations, particulate matter is differentiated by particle size as opposed to composition. Federal air quality standards differentiate two size fractions of PM: PM that is 10 microns or less in diameter (PM10) and the smaller subset that is 2.5 microns or less in diameter (PM2.5).

The mountain ranges that surround the Valley contribute to trapping pollutants, including PM, in the Valley. During the winter, weather systems bring rainfall to the

Valley, but the atmospheric environment also becomes conducive to secondary PM formation. The Valley's frequent and strong winter temperature inversions prevent air from rising and particulates remain trapped near the surface. During winters with little rainfall or the Valley's hot, dry summers, the dry soils contribute to PM emissions when disturbed.

The California Regional Particulate Air Quality Study (CRPAQS) is the Valley's comprehensive particulate field study. CRPAQS monitoring occurred between December 1999 and February 2001 through the use of over 70 SPM PM10 sites and 50 SPM PM2.5 sites. Researchers have used CRPAQS measurements for database development, analysis, and modeling. Data collection for the study has been completed but the data analysis is still ongoing. In addition to CRPAQS, other studies assess particulate emissions from agricultural operations, unpaved and paved road particulate emissions, and particulate formation in fog episodes. The design of the Valley's current PM network is an outgrowth of the results and analysis from CRPAQS.

The Valley's PM monitoring network includes Federal Reference Method (FRM) monitors, Federal Equivalent Method (FEM) monitors, and Non–FRM/FEM monitors. FRM monitors for PM are manual filter–based monitors; samples are collected on either a one–in–six day sampling schedule or a one–in–three day sampling schedule. FRM monitors meet the "Standards/Strategy" objective, helping agencies determine the Valley's attainment status and helping shape the strategies for reaching or maintaining PM attainment. FRM filters can also be analyzed for PM speciation, so they are sometimes used for "Research Support" objectives as well.

Beta Attenuation Monitors (BAM) and Tapered Element Oscillating Microbalance (TEOM) monitors are continuous, near real–time monitors that provide the hourly PM data used in AQI and Smoke Management System (SMS) burn allocations. Data from these monitors are also used in hazard reduction burning allocations and in residential wood burning declarations. As such, these monitors help meet the "Timely/Public" objective.

Not all real–time monitors meet the "Standards/Strategy" objective because they do not meet the rigorous engineering design, quality assurance, and quality control standards necessary for comparison to the NAAQS. An FEM monitor is often a real–time monitor that has been designated by EPA as being equivalent to FRM monitors. FEMs satisfy both the "Standards/Strategy" objective and the "Timely/Public" objective. All of the Valley's TEOMs are FEMs, and some of the Valley's BAMs are FEMs.

PM10 Monitors in the Valley

The San Joaquin Valley has been redesignated to attainment for PM10, and the District's *2007 PM10 Maintenance Plan* and ongoing PM10 monitoring will assure continued compliance with the federal standard. Table 10 shows the minimum number of PM10 sites required per MSA and Table 11 shows the PM10 monitoring requirements for the San Joaquin Valley. The Valley's SLAMS and SPM PM10 monitoring stations are summarized in Tables 12a, 12b, and 13 respectively.

Table 10 Minimum PM10 Monitoring Requirements

(Table D–4 of Appendix D to Part 58)

(A range is presented, and the actual number of stations per area is jointly determined by EPA, the State, and the local agency)

Population category	High concentration: Ambient concentrations exceed the PM10 NAAQS by 20% or more (≥180 µg/m³)	Medium concentration: Ambient concentrations exceed 80% of the PM10 NAAQS (>120 µg/m³)	Low concentration: Ambient concentrations less than 80% of the PM10 NAAQS (< 120 µg/m³), or no design value
> 1,000,000	6 – 10	4 – 8	2 – 4
500,000 – 1,000,000	4 – 8	2 – 4	1 – 2
250,000 – 500,000	3 – 4	1 – 2	0 – 1
100,000 – 250,000	1 – 2	0 – 1	0

Table 11 PM10 Monitoring requirements for the Valley

Metropolitan Statistical Area (MSA)	County	2012 Population	PM10			
			24–hour 2012 Highest concentration in MSA (µg/m³)[1]	Monitors required	Actual # of SLAMS sites in MSA	Actual # of SPM sites in MSA
Bakersfield[2]	Kern	731,005	100	1 – 2	2	0
Fresno	Fresno	945,711	114	1 – 2	3	0
Hanford–Corcoran	Kings	152,419	128	1 – 2	2	1
Madera	Madera	152,074	115	0	1	0
Merced	Merced	258,736	89	0 – 1	1	0
Modesto	Stanislaus	519,940	103	1 – 2	2	0
Stockton	San Joaquin	695,750	139	2 – 4	2	2
Visalia–Porterville	Tulare	450,840	76	0 – 1	1	0

[1] Pending Exceptional Events are excluded from Table 10.

[2] The Bakersfield–Golden State AMS was closed in December 2009 due to planned road construction and was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) AMS in 2012. The PM10 and PM2.5 monitors were operational at Bakersfield–Muni from July 2012 until late February 2013. See Appendix C for details.

Table 12a San Joaquin Valley PM10 SLAMS monitor information

MSA/CBSA: Bakersfield **County:** Kern				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Oildale	Neighborhood	Population	Standards/Strategy Research Support	1:6
Bakersfield–California	Neighborhood	Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Fresno **County:** Fresno				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Fresno–Drummond	Neighborhood	Population	Standards/Strategy Research Support	1:6
Fresno–Garland	Urban	NCORE	Population Exposure	1:1
Clovis–Villa	Neighborhood	Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Hanford–Corcoran				
County: Kings				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Hanford–Irwin	Neighborhood	Population	Standards/Strategy Research Support	1:6
Corcoran–Patterson	Neighborhood	High Concentration	Standards/Strategy Research Support	1–Hour
MSA/CBSA: Madera **County:** Madera				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Madera–City	Neighborhood	Population	Standards/Strategy Research Support Timely/Public	1–Hour

Table 12a San Joaquin Valley PM10 SLAMS monitor information (Continued)

MSA/CBSA: Merced **County:** Merced				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Merced–M Street	Neighborhood	High Concentration, Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Stockton–Hazelton	Neighborhood	Population	Standards/Strategy Research Support	1:6
Stockton–Wagner/ Holt	Neighborhood	Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Modesto **County:** Stanislaus				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Modesto–14th Street	Neighborhood	Population	Standards/Strategy Research Support	1:6
Turlock	Neighborhood	Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Visalia–Porterville **County:** Tulare				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Visalia–Church	Neighborhood	Population	Standards/Strategy Research Support	1:6

Table 12b San Joaquin Valley PM10 SPM monitor information

MSA/CBSA: Hanford–Corcoran **County:** Kings				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Hanford–Irwin	Neighborhood	Population	Research Support Timely/Public	1–Hour
MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Manteca	Neighborhood	Population	Standards/Strategy Research Support	1–Hour
Tracy–Airport	Neighborhood	Regional transport	Standards/Strategy Research Support Timely/Public	1–Hour

Table 13 San Joaquin Valley PM10 monitor types

MSA/CBSA: Bakersfield **County:** Kern[1]	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Bakersfield–California	1		1	
Oildale	1		1	
Total SLAMS/SPM			**2**	
MSA/CBSA: Fresno **County:** Fresno	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Clovis–Villa	1		1	
Fresno–Drummond	1		1	
Fresno–Garland		1	1	
Total SLAMS/SPM			**3**	

[1] The Bakersfield–Golden State AMS was closed in December 2009 and was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) AMS in 2012. The PM10 and PM2.5 monitors were operational at Bakersfield–Muni from July 2012 until late February 2013. See Appendix C for details.

Table 13 San Joaquin Valley PM10 monitor types (Continued)

MSA/CBSA: Hanford–Corcoran **County:** Kings	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Corcoran		1	1	
Hanford–Irwin	1		1	
		1		1
Total SLAMS/SP			**2**	**1**
MSA/CBSA: Madera **County:** Madera	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Madera–City		1	1	
Total SLAMS/SPM			**1**	
MSA/CBSA: Merced **County:** Merced	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Merced–M Street	1		1	
Total SLAMS/SPM			**1**	
MSA/CBSA: Stockton **County:** San Joaquin	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Manteca		1		1
Stockton–Hazelton	1		1	
Stockton–Wagner/Holt	1		1	
Tracy–Airport		1		1
Total SLAMS/SPM			**2**	**2**

Table 13 San Joaquin Valley PM10 monitor types (Continued)

MSA/CBSA: Modesto **County:** Stanislaus	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Modesto–14th Street	1		1	
Turlock	1		1	
Total SLAMS/SPM			**2**	
MSA/CBSA: Visalia – Porterville **County:** Tulare	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Visalia–Church	1		1	
Total SLAMS/SPM			**1**	

PM2.5 Monitors in the Valley

The San Joaquin Valley is designated nonattainment for PM2.5. Table 14 shows the minimum number of PM2.5 sites required per MSA and Table 15 shows the PM2.5 monitoring requirements for the San Joaquin Valley. The Valley's SLAMS and SPM PM2.5 monitoring stations are summarized in Tables 16a, 16b, and 17 respectively.

Table 14 Minimum PM2.5 Monitoring Requirements

MSA population	**Most recent 3–year design value ≥85% of any PM2.5 NAAQS** (equivalent to an annual design value ≥ 10.2 µg/m³ or a 24–hour design value ≥ 29.8 µg/m³), or no design value	**Most recent 3–year design value <85% of any PM2.5 NAAQS** (equivalent to an annual design value < 10.2 µg/m³ or a 24–hour design value < 29.8 µg/m³), or no design value
> 1,000,000	3	2
500,000 – 1,000,000	2	1
50,000 – < 500,000	1	0

Table 15 PM2.5 Monitoring requirements for the Valley

Metropolitan Statistical Area (MSA)	County	2012 Population	PM2.5[1]				
			24–hour 2010–2012 Design Value in MSA (µg/m³)	Annual 2010–2012 Design Value in MSA (µg/m³)	Monitors required	Actual # of SLAMS sites in MSA	Actual # of SPM sites in MSA
Bakersfield[2]	Kern	731,005	58	15.6	2	2	1
Fresno[3]	Fresno	945,711	57	14.8	2	3	4
Hanford–Corcoran	Kings	152,419	54	15.8	1	1	1
Madera	Madera	152,074	51	19.0	1	1	0
Merced	Merced	258,736	41	14.3	1	1	1
Modesto	Stanislaus	519,940	49	14.9	2	3	0
Stockton	San Joaquin	695,750	38	11.6	2	2	1
Visalia–Porterville	Tulare	450,840	47	14.8	1	1	3

[1] Air quality data may include data influenced by exceptional events and/or data completeness and substitution requirements.

[2] The Bakersfield–Golden State AMS was closed in December 2009 and was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) AMS in 2012. The PM10 and PM2.5 monitors were operational at Bakersfield–Muni from July 2012 until late February 2013. See Appendix C for details.

[3] During January 2012, the Fresno–First Street AMS closed and moved two blocks to the north where it became the Fresno–Garland AMS so the January 2012 values from the Fresno–First site were not counted. The 2010 and 2011 values from the Fresno–First site were combined with the 2012 values from the Fresno–Garland site to determine the values shown in the Table 14.

Table 16a San Joaquin Valley PM2.5 SLAMS monitor information

MSA/CBSA: Bakersfield
County: Kern

Site Name	Scale	Site Type	Monitoring Objective	Sampling Schedule
Bakersfield–Planz	Neighborhood	Population	Standards/Strategy	1:3
Bakersfield–California	Neighborhood	Population	Standards/Strategy	Daily

Table 16a San Joaquin Valley PM2.5 SLAMS monitor information (Continued)

MSA/CBSA: Fresno **County:** Fresno				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Fresno–Pacific	Neighborhood	Population	Standards/Strategy Research Support	1:3
Fresno–Garland	Neighborhood	High Concentration	Standards/Strategy Research Support	Daily
Clovis–Villa	Neighborhood	High Concentration	Standards/Strategy Research Support	1:3
MSA/CBSA: Hanford–Corcoran **County:** Kings				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Corcoran–Patterson	Neighborhood	High Concentration	Standards/Strategy Research Support	1:3
MSA/CBSA: Madera **County:** Madera				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Madera–City	Neighborhood	Population	Standards/Strategy Research Support Timely/Public	1–Hour
MSA/CBSA: Merced **County:** Merced				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Merced–M Street	Neighborhood	Population	Standards/Strategy Research Support	1:3

Table 16a San Joaquin Valley PM2.5 SLAMS monitor information (Continued)

MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Manteca	Neighborhood	Population	Standards/Strategy Research Support	1–Hour
Stockton–Hazelton	Neighborhood	Population	Standards/Strategy Research Support	1–Hour
			Standards/Strategy Research Support Timely/Public	1–Hour
MSA/CBSA: Modesto **County:** Stanislaus				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Modesto–14th Street	Neighborhood	Population	Standards/Strategy Research Support	1:3 / 1–Hour
			Standards/Strategy Research Support Timely/Public	1–Hour
Turlock	Neighborhood	Population	Standards/Strategy Research Support Timely/Public	1–Hour
MSA/CBSA: Visalia – Porterville **County:** Tulare				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Visalia–Church	Neighborhood	Population	Standards/Strategy Research Support	1:3

Table 16b San Joaquin Valley PM2.5 SPM monitor information

Site Name	Scale	Site Type	Monitoring Objective	Sampling Schedule
MSA/CBSA: Bakersfield **County:** Kern[1]				
Bakersfield–California	Neighborhood	Population	Area–wide	1–Hour
Lebec	Neighborhood	Population	Research Support Timely/Public	1–Hour
MSA/CBSA: Fresno **County:** Fresno				
Fresno–Garland	Neighborhood	High Concentration	Area–wide	1–Hour
Fresno–Drummond	Neighborhood	High Concentration	Research Support Timely/Public	1–Hour
Huron	Neighborhood	Population	Research Support Timely/Public	1–Hour
Tranquillity	Urban	Background	Standards/Strategy Research Support Timely/Public	1–Hour
MSA/CBSA: Hanford–Corcoran **County:** Kings				
Hanford–Irwin	Neighborhood	Population	Research Support Timely/Public	1–Hour
MSA/CBSA: Merced **County:** Merced				
Merced–Coffee	Neighborhood	Population	Research Support Timely/Public	1–Hour

[1] The Bakersfield–Golden State AMS was closed in December 2009 and was relocated to the Bakersfield– Municipal Airport (Bakersfield–Muni) AMS in 2012. The PM2.5 monitor operated for a short time. See Appendix C for details.

Table 16b San Joaquin Valley PM2.5 SPM monitor information (Continued)

MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Tracy–Airport	Neighborhood	Regional transport	Research Support Timely/Public	1–Hour
MSA/CBSA: Visalia–Porterville **County:** Tulare				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Sequoia–Ash Mountain	Regional	Regional transport	Research Support Timely/Public	1–Hour
Porterville	Neighborhood	Population	Research Support Timely/Public	1–Hour
Visalia–Church	Neighborhood	Population	Area–wide	1–Hour

Table 17 San Joaquin Valley PM2.5 monitor types

MSA/CBSA: Bakersfield **County:** Kern[1]	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Bakersfield–Planz	1			1	
Bakersfield–California	1			1	
			1		1
Lebec			1		1
Total SLAMS/SPM				**2**	**2**
MSA/CBSA: Fresno **County:** Fresno	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Clovis–Villa	1	1		1	
Fresno–Garland	1			1	
			1		1
Fresno–Pacific	1			1	
Fresno–Drummond		1			1
Huron			1		1
Tranquillity		1			1
Total SLAMS/SPM				**3**	**4**

[1] The Bakersfield–Golden State AMS was closed in December 2009 and was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) AMS in 2012. The PM10 and PM2.5 monitors were operational at Bakersfield–Muni from July 2012 until late February 2013. See Appendix C for details.

Table 17 San Joaquin Valley PM2.5 monitor types (Continued)

MSA/CBSA: Hanford–Corcoran **County:** Kings	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Corcoran–Patterson	1			1	
Hanford–Irwin		1			1
Total SLAMS/SPM				**1**	**1**

MSA/CBSA: Madera **County:** Madera	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Madera–City		1		1	
Total SLAMS/SPM				**1**	

MSA/CBSA: Merced **County:** Merced	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Merced–Coffee		1			1
Merced–M Street	1			1	
Total SLAMS/SPM				**1**	**1**

MSA/CBSA: Stockton **County:** San Joaquin	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Manteca		1		1	
Stockton–Hazelton		1		1	
Tracy–Airport			1		1
Total SLAMS/SPM				**2**	**1**

MSA/CBSA: Modesto **County:** Stanislaus	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Modesto–14th Street	1	1		2	
Turlock		1		1	
Total SLAMS/SPM				**3**	

Table 17 San Joaquin Valley PM2.5 monitor types (Continued)

MSA/CBSA: Visalia–Porterville **County:** Tulare	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non–FEM**	**SLAMS**	**SPM**
Site Name					
Porterville			1		1
Sequoia–Ash Mountain			1		1
Visalia–Church	1			1	
			1		1
Total SLAMS/SPM				**1**	**3**

PM Collocation Requirements

(40 CFR 58 Appendix A, Sections 3.2.5 and 3.2.6)

The District's Particulate Matter collocation requirements are met by the "Primary Quality Assurance Organization" (PQAO). ARB is the PQAO for the District as well as several other air districts. See CARB's Air Monitoring Network Plans for details on how collocation requirements are met by the PQAO.

Public Review of Changes to the PM2.5 Monitoring Network

Public input is required whenever the District proposes to move an existing violating PM2.5 monitor (40 CFR 58.10(c)). The District uses the annual Air Monitoring Network Plan to notify and seek public comment on any planned changes to the existing PM2.5 network. The public has 30 days to comment on the Monitoring Network Plan and any PM2.5 network changes. The plan is posted on the District website, and public notice is published in a newspaper of general circulation in each affected CBSA.

In the event of unanticipated changes to the PM2.5 network that occur outside the Monitoring Network Plan process, the District will post public notice in Valley newspapers, post a document describing the proposed changes on its website, and seek public comment.

Carbon Monoxide

On August 12, 2011 EPA issued the decision to retain the existing NAAQS for CO. The primary standards are 9 parts per million (ppm) measured over 8 hours, and 35 ppm measured over 1 hour. As specified in 40 CFR Part 58 Appendix D Section 4.2, one CO monitor is required to be placed at a "near–road" NO_2 monitoring station in a CBSA with population of 1 million or more. Moving an existing monitor to a new location is acceptable.

At NCore sites, CO monitors required in CBSAs with populations of 2.5 million or more are to be operating by January 1, 2015, and CO monitors required in CBSAs with populations of 1 million or more are to be operational by January 1, 2017. Currently, the CBSAs within the District are comprised of less than 1 million people, thus the District is not required to place a CO monitor at a near–road NO_2 monitoring station. EPA is

providing authority to EPA Regional Administrators to require additional monitoring in case–by–case circumstances, such as in areas impacted by major stationary CO sources, in urban downtown areas, or urban street canyons, or in areas adversely impacted by meteorological and/or topographical influences.

In the past, monitoring has shown that the Valley's CO concentrations have not exceeded the NAAQS for over a decade. As noted in Section 4.2 of Appendix D of 40 CFR Part 58, there are no minimum requirements of the number of CO monitoring sites. The District continues CO monitoring to supplement related meteorological and criteria pollutant data. Table 18 summarizes the Valley's CO monitoring sites.

Table 18 Carbon Monoxide Monitoring Stations in the San Joaquin Valley

Site Name	Sampling Frequency	Scale	Site Type	Objective
Bakersfield–Muni [1]	Continuous	Neighborhood	Population	Standards/ Strategy
Clovis–Villa	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–Drummond	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–Garland [2]	Continuous	Neighborhood	Population	Max Precursor Emissions Impact
Fresno–Sky Park	Continuous	Neighborhood	Population	Standards/ Strategy
Modesto–14th Street	Continuous	Neighborhood	Population	Population Exposure
Stockton– Hazelton	Continuous	Neighborhood	Population	Population Exposure
Turlock	Continuous	Neighborhood	Population	Standards/ Strategy

[1] The Bakersfield–Golden State AMS was closed in December 2009 and has been relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) site.

[2] In December 2011, CARB moved the Fresno–First air monitoring station to Garland Avenue which is two blocks north of the Fresno–First site.

Nitrogen Dioxide

In 2010, EPA retained the annual average NO_2 standard of 53 ppb, and established a new 1–hour NO_2 standard at the level of 100 parts per billion (ppb). Recognizing that the current NO_2 network is not adequate for fully assessing compliance with the new NAAQS, EPA finalized a Three–Tier Network design that will represent NO_2 concentrations that occur near freeways, urban areas, and locations aimed at protecting susceptible and vulnerable communities. Per 40 CFR Part 58, the Three–Tier Network design is comprised of:

(1) In CBSAs with more than 1,000,000 people, one monitor that represents highest NO_2 exposure with a neighborhood scale or larger
(2) Near–road monitoring at locations of expected maximum 1–hour NO_2 concentrations near heavily trafficked roads in urban areas
(3) A NO_2 network consisting of 40 monitors designed by the Regional Administrators to protect susceptible and vulnerable communities

Even though the District is not required to have an area–wide monitor, the District operates an extensive NO_2 monitoring network. The District locates NO_2 analyzers as required at PAMS AMSs and generally collocates NO_2 analyzers wherever an ozone monitor is required. Currently, these 16 monitors indicate that the District has low NO_2 levels that would be in compliance with both the NO_2 standards if the site met NAAQS siting criteria. Because these measurements are low and traffic volumes are also low when compared to other areas of the State, the District anticipates meeting the hourly standard once the near–road monitors are built and begin collecting data. The NO_2 monitoring stations in the San Joaquin Valley are shown in Table 19.

The District is in the process of locating and building one NO_2 near–road monitoring site in each of the Fresno, Bakersfield, Stockton, and Modesto CBSAs (four in total). The District has found potential NO_2 near–road monitoring sites in the Bakersfield and Fresno CBSAs. The required documentation for these two NO_2 near–road monitoring sites is found in Appendix D and E. The search for the other two locations is continuing and will be presented to the public as required by the CFR.

The third network, the Regional Administrator Required Monitoring Network (RA40) will consist of 40 NO_2 sites located throughout the United States and their locations will be determined by the Regional Administrators. These 40 sites would be in addition to the minimum NO_2 monitoring requirements. The specific locations for these sites have not been determined by EPA Region 9. The District will work with EPA Region 9 to address RA40 NO_2 siting, as appropriate.

Table 19 NO_2 Monitoring Stations in the San Joaquin Valley

Site Name	Sampling Frequency	Scale	Site Type	Objective
Bakersfield–California	Continuous	Neighborhood	Population	Population Exposure
Bakersfield–Muni [1]	Continuous	Neighborhood	High Concentration	Standards/Strategy, Research
Clovis–Villa	Continuous	Neighborhood	High Concentration	Standards/Strategy, Research
Edison	Continuous	Neighborhood	Population	Population Exposure
Fresno–Drummond	Continuous	Neighborhood	High Concentration	Standards/Strategy
Fresno–Garland	Continuous	Neighborhood	Population	Max Precursor Emissions Impact
Fresno–Sky Park	Continuous	Neighborhood	Population	Standards/Strategy
Hanford–Irwin	Continuous	Neighborhood	Population	Standards/Strategy, Research, Timely/Public
Madera–Pump	Continuous	Neighborhood	Population	Standards/Strategy, Research
Merced–Coffee	Continuous	Neighborhood	Population	Standards/Strategy
Parlier	Continuous	Neighborhood	Population	Standards/strategy, Research
Shafter	Continuous	Neighborhood	Population	Population exposure
Stockton–Hazelton	Continuous	Neighborhood	Population	Population Exposure
Tracy–Airport	Continuous	Neighborhood	Population	Standards/Strategy
Turlock	Continuous	Neighborhood	Population	Standards/Strategy
Visalia–Church	Continuous	Neighborhood	Population	Standards/Strategy

[1] The Bakersfield–Golden State NO_2 monitor was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) site in 2012.

Sulfur Dioxide

In 2010, EPA revised the SO_2 NAAQS and monitoring requirements in the Federal Register (CFR, 40 CFR Part 58, Section 4.4). EPA established a new primary 1–hour standard of 75 parts per billion (ppb), and also revoked the previous 24–hour and annual primary standards. The number of monitor requirements for SO_2 is determined by the Populations Weighted Emissions Index (PWEI) value in units of million persons–tons per year. The PWEI is calculated using each CBSA's updated census data or estimates, and a combined total of the latest available county level SO_2 emissions data in the National Emissions Inventory for the counties in each CBSA. The population of a

CBSA is multiplied with the total amount of SO_2 in tons per year emitted within a CBSA, and the resulting product is then divided by one million to produce the PWEI value. The Valley's PWEI values are shown in Table 20a.

Table 20a Populations Weighted Emissions Index for the San Joaquin Valley

County (CBSA)	Total County Population [1]	SO_2 Tons per Year [2]	PWEI
Fresno	945,711	458	433
Kern	850,006	2,212	1,880
Kings	152,419	55	8
Madera	152,074	113	17
Merced	258,736	66	17
San Joaquin	695,750	1,097	763
Stanislaus	519,940	312	162
Tulare	450,840	122	55

[1] Total County Population includes the entire county. Population data from California Department of Finance E–1 Population Estimates for Cities, Counties and the State, January 1, 2012.

[2] SO_2 Tons per Year includes the entire county. SO_2 data is from the most recent data available from the 2008 National Emissions Inventory for each county. The data from the 2009 National Emissions Inventory for each county are not yet available.

As per 40 CFR Part 58, Appendix D Section 4.4, at least three SO_2 monitors are required in CBSAs with a PWEI value equal to or greater than 1,000,000. CBSAs with a PWEI value equal to or greater than 100,000, but less than 1,000,000, are required to have at least two SO_2 monitors. A minimum of one SO_2 is required in CBSAs with a PWEI value equal to or greater than 5,000, but less than 100,000. There is no required number of SO_2 monitors for CBSAs that do not exceed the federal standard for SO_2. The Valley does not exceed the federal standard for SO_2 but there is one SO_2 monitoring site in the Valley (shown in Table 20b). This Fresno–Garland monitor is operated by CARB and is part of the NCore Network.

Table 20b SO_2 Monitoring Station in the San Joaquin Valley

Site Name	Sampling Frequency	Scale	Site Type	Objective
Fresno–Garland	Continuous	Neighborhood	Population	Standards/ Strategy

Lead

EPA revised the lead NAAQS and monitoring requirements in the Federal Register on November 12, 2008 (40 CFR 58.10). The rule became effective on January 26, 2011. EPA requires monitoring agencies to install non–source oriented lead monitors at NCore sites in CBSAs with populations of 500,000 or greater. The only site meeting these criteria within the District is Fresno–Garland which is operated by the California

Air Resources Board. In December 2011, CARB installed a TSP–Lead sampler to satisfy this requirement. EPA also requires state monitoring agencies to use the emission threshold of 0.5 tons per year (tpy) when determining if a monitor should be placed near an industrial facility that emits lead. The emission threshold for airport sources is 1.0 tpy, except for airports that are included in special studies. The District has not identified any lead sources above the aforementioned thresholds, thus it is not required to monitor for that threshold at this time.

Toxics

The airborne toxics program is run by the CARB. Toxics measurements are collected at Bakersfield–California, Fresno–Garland, and Stockton–Hazelton. Periodic, 24–hour samples are analyzed for the following gases: benzene, Carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl chloroform, methylene chloride, perchloroethylene, toluene, trichloroethylene, and m–, p–, and o–xylene. The samples are also analyzed for the following particulate metals: arsenic and chromium–6. CARB's Integrated NMOC sampling program and the District's PAMS NMOC sampling program also identify and quantify several toxic hydrocarbon species.

NCore

EPA's October 2006 ambient air monitoring amendments established a requirement for National Core (NCore) multi–pollutant monitoring stations to be operational by January 1, 2011. The Fresno–First AMS, which was operated by CARB, was selected by EPA to be an NCore site. CARB submitted an NCore plan to EPA in November 2009. The Fresno—First site already met the NCore requirements for filter–based and continuous PM2.5, speciated PM2.5, ozone, and meteorology. In December 2010, CARB installed trace level CO, trace level SO_2, trace level NOy, and continuous PM–Coarse monitors at this site. A gas dilution calibrator, a zero air generator, and digital data loggers were also installed to support NCore monitoring. In December 2011, CARB installed a TSP–lead sampler which completed all the pollutant monitoring requirements for the NCore program. Additionally, CARB moved the Fresno–First AMS to Garland Avenue which is two blocks north of the Fresno–First site. The Fresno–Garland AMS continues to serve as an NCore site. This relocation was recently approved by EPA, see Appendix F for details.

Meteorology

A variety of meteorological parameters are measured for various District programs affected by weather. Such programs include air quality forecasting, PAMS, exceptional events, long–term planning, and pollutant trend assessment. These activities help protect public health and have made the public and media more aware of air quality and what can be done to reduce air pollution. See Table 21 for the meteorological parameters measured in the Valley.

Table 21 Meteorological Parameter Monitoring Stations in the San Joaquin Valley

Site	Wind Speed	Wind Direction	Outdoor Temperature	Relative Humidity	Barometric Pressure	Solar Radiation
Arvin–Di Giorgio			X			
Bakersfield–California	X	X	X	X	X	X
Bakersfield–Muni [1]	X	X	X	X	X	X
Clovis–Villa	X	X	X	X	X	X
Corcoran–Patterson	X	X	X		X	
Edison	X	X	X			
Fresno–Drummond	X	X	X		X	
Fresno–Garland	X	X	X	X	X	
Fresno–Sky Park	X	X	X			
Hanford–Irwin	X	X	X		X	
Huron					X	
Lebec	X	X	X		X	
Madera–City	X	X	X	X	X	X
Madera–Pump Yard	X	X	X	X	X	X
Manteca	X	X	X		X	
Maricopa	X	X	X		X	
Merced–Coffee	X	X	X			
Modesto–14th Street	X	X	X		X	
Oildale	X	X	X			
Parlier	X	X	X	X	X	X
Porterville	X	X	X		X	
Sequoia–Ash Mountain	X	X	X	X		X
Sequoia–Lower Kaweah	X	X	X	X		X
Shafter	X	X	X	X	X	X
Stockton–Hazelton	X	X	X	X		
Tracy–Airport	X	X	X		X	
Tranquillity	X	X	X		X	
Turlock	X	X	X		X	
Visalia–Church	X	X	X		X	
Visalia–Airport	X	X	X	X	X	X

[1] The Bakersfield–Golden State AMS was closed in December 2009 and has been relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) site.

Summary of Recent Changes to the District's Air Monitoring Network (Period: 2011 through Current)

- In 2011 and 2012, Anderson sampling instruments at the Fresno–Pacific, Merced–M Street, Corcoran, Clovis, and Corcoran monitoring sites were replaced with Partisol Units.

- In December 2011, CARB moved the Fresno–First AMS to Garland Avenue which is two blocks north of the Fresno–First site. The new site is now referred to as Fresno–Garland and became operational on December 31, 2011. On March 7, 2013, EPA official approved the relocation and a copy of the letter is attached as Appendix F.

- In 2011, the Corcoran AMS was shut down temporarily due to safety issues and repairs were made to the site. The site resumed operating in August 2012 with a Grimm 180 PM2.5 monitor being used for acceptance testing and evaluation purposes, a real–time PM10 monitor, and a filter–based PM2.5 FRM monitor. Redundant PM10 monitors were removed and the higher time resolution monitor kept. The collocated PM10 monitor was moved to the Fresno–Drummond site.

- The collocated PM10 monitor at the Fresno–Drummond site began reporting data in October 2012.

- The temporary PM10 monitor at the Bakersfield–California site was moved to the Bakersfield–Muni site which replaced the Bakersfield–Golden site however the monitor is no longer operating at Bakersfield–Muni since PM monitoring is being moved to a new location (see Appendix C for details).

- A PM2.5 FEM/BAM Special Purpose Monitor was installed at the Fresno Drummond site in October 2012. The purpose of this analyzer is to provide data to compare with the Fresno–Pacific analyzer.

- In December 2009, the District was forced to close the Bakersfield–Golden State Highway (Bakersfield–Golden) air monitoring station (AMS) due to the expansion of Golden State Highway and subsequent loss of the air monitoring site lease. As referenced in the District's previous Network Plans as a planned change to the air monitoring network, the Bakersfield–Golden AMS was relocated to the Bakersfield–Municipal Airport (Bakersfield–Muni) site. The Bakersfield–Muni site was intended to serve primarily as a PAMS Type 2 site, in addition to providing monitoring of both PM10 and PM2.5 for forecasting purposes. All of the equipment was installed in 2012. However, it soon became apparent that this site was not acceptable as a PM10 and PM2.5 site because site specific emissions from nearby sources were impacting the site, and the site was therefore not measuring ambient particulate concentrations. The PM10 and PM2.5 analyzers were subsequently removed at the end of February 2013, for potential relocation to a better site as soon as practicable. For complete details see Appendix C.

Summary of Planned Changes to the District's Air Monitoring Network (Period: Current through Mid–2014)

The Valley air monitoring network is continually being improved. MSA–specific changes are generally described below. Before any action is taken on the planned changes noted in this section, the District will work with ARB and EPA, as appropriate, to address necessary requirements for documentation.

EPA has recently changed both CO and NOx monitoring regulations. EPA has noted that some of the existing analyzers are no longer needed for NAAQS purposes. The District will examine the CO and NOx monitoring network requirements to determine whether or not changes are needed to the existing network.

Stockton CBSA/MSA

The District is planning on shutting down the Stockton Wagner/Holt AMS PM10 AMS in 2013, given that the existing Stockton Hazelton PM10 AMS meets the minimum PM10 monitoring requirements for Stockton CBSA/MSA. Additionally, PM10 Special Purpose Monitors (SPM) in Tracy and Manteca provide PM10 monitoring in Stockton CBSA/MSA. Required documentation for this change will be provided to EPA outside of this network plan.

Modesto CBSA/MSA

The District does not have any changes scheduled for this MSA during this time period.

Merced CBSA/MSA

The District does not have any changes scheduled for this MSA during this time period.

Madera CBSA/MSA

The District may investigate consolidating Madera–Pump into the Madera–City site.

Fresno CBSA/MSA

The District is investigating consolidating Fresno–Pacific into the Fresno–Drummond site. To provide supporting information, the District has installed an SPM at the Fresno–Drummond AMS. In addition, a NOy monitor will be added to the Parlier site comply with the regulations for PAMS Type 3 sites.

Hanford–Corcoran CBSA/MSA

The District has started analyzing the data from the Grimm 180 and preliminary indications are that the Grimm 180 measurements are running considerably higher than those of the FRM monitor. In order to meet District's needs, the Grimm 180 measurements should reasonably match the measurements of the FRM. While the

Grimm 180 has earned a FEM certification by EPA, the District has found that not all FEM certified analyzers work well in the San Joaquin Valley.

Visalia–Porterville CBSA/MSA

The District does not have any changes scheduled for this MSA during this time period.

Bakersfield CBSA/MSA

The District plans to install PAMS Type 3 equipment when space becomes available at an appropriate location in the Arvin area.

Data Submission Requirements

Air Quality and Precision data are submitted to EPA on an ongoing basis once all air quality assurance checks are completed by the District. Accuracy data is submitted to EPA by CARB as part of their scheduled audits. The District has certified the 2012 Air Quality data.

Acronyms and Abbreviations

AIRS: Aerometric Information Retrieval System
AQI: Air Quality Index
AQS: Air Quality System
CARB: California Air Resources Board
ARM: Approved Regional Method
BAM: Beta Attenuation Monitor
CAA: Clean Air Act
CBSA: Core–Based Statistical Area
CCOS: Central California Ozone Study
CFR: Code of Federal Regulations
CRPAQS: California Regional Particulate Air Quality Study
CO: Carbon Monoxide
CO_2: Carbon Dioxide
CSA: Combined statistical area
District: San Joaquin Valley Air Pollution Control District
EBAM: Environmental Beta Attenuation Monitor
EPA: U.S. Environmental Protection Agency
FEM: Federal Equivalent Method
FIPS: Federal information processing standard
FR: Federal Register
FRM: Federal Reference Method
GHG: Green House Gases
MSA: Metropolitan statistical area
NAAQS: National Ambient Air Quality Standard
NCore: National Core
NMOC: Non–Methane Organic Compounds
NO_2: Nitrogen Dioxide
NOAA: National Oceanic and Atmospheric Administration
NOx: Oxides of Nitrogen
NO_y: Reactive Nitrogen
NPS: National Park Service
O_3: Ozone
PAMS: Photochemical Assessment Monitoring Station
Pb: Lead
PM: Particulate Matter
PM2.5: Particulate Matter 2.5 microns or less in diameter
PM10: Particulate Matter 10 microns or less in diameter
SLAMS: State and Local Air Monitoring Station
SJV: San Joaquin Valley
SJVAPCD: San Joaquin Valley Air Pollution Control District
SMS: Smoke Management System
SO_2: Sulfur Dioxide
SPM: Special Purpose Monitor
STN: Speciated Trends Network
TEOM: Tapered Element Oscillating Microbalance
TSP: Total Suspended Particles
Valley: San Joaquin Valley
VOC: Volatile Organic Compounds

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